INTRODUCTION

PRIMARY MISSION

The primary mission of Portsmouth Naval Shipyard (PNSY) is to overhaul, repair, and modernize the U.S. Navy's nuclear-powered submarine fleet and to complete the work in a safe, timely, and affordable manner. PNSY is one of four remaining Naval Shipyards in the nation. PNSY has three dry docks that are used to overhaul both Los Angeles and Virginia class nuclear powered submarines.

SHIPYARD, MILITARY, & TENANT POPULATIONS

Approximately 5,600 civilian employees (including tenant commands and contractors) currently work at PNSY, along with 1,000 active duty military personnel (including estimated rotating sub crews). Although PNSY functions primarily as an industrial facility for the overhauling of submarines, it also provides support facilities for the U.S. Navy Survival, Evasion, Resistance, & Escape (SERE) School, the Naval Branch Health Clinic Portsmouth, the U.S. Army Recruiting Battalion, the Defense Logistics Agency, and the U.S. Coast Guard. PNSY also supports military personnel with on-base berthing, family-oriented programs, and recreational opportunities.

FACILITY LOCATION & DESCRIPTION

PNSY is located in the Town of Kittery, Maine at the southernmost tip of the state, approximately 50 miles north of Boston, Massachusetts. PNSY fully encompasses Seavey Island, which is situated at the mouth of the Piscataqua River. The Piscataqua River is a tidal estuary that forms a natural boundary between Maine (ME) and New Hampshire (NH). This Federally-owned island is located across the harbor from Portsmouth, NH, with access to the mainland via two bridges connected to Kittery, ME. The main base of PNSY is approximately 288 acres in size, over 62 acres of which is managed as the Controlled Industrial Area (CIA). Industrial activities are concentrated at the western portion of the base within the tightly-controlled CIA, which includes all dry docks, vessel berths, and numerous buildings that house trade shops supporting maintenance activities. Areas outside the CIA generally include additional trade shops, administration offices, officers' residences, vehicle parking, and recreational facilities.

INSTALLATION HISTORY

PNSY was officially established as a Federal facility in 1800. The facility's primary mission at that time was to build and repair Navy warships. The first government-built submarine, the "*L-8*", was designed and constructed at PNSY in 1917 during World War I. PNSY continued to build submarines until 1969 when the mission was realigned to function exclusively as a submarine overhaul facility. Today, PNSY services some of the most technologically advanced nuclear-powered submarines in the world including the Virginia class submarine.

SUSTAINABLE SHIPYARD BACKGROUND

Executive Orders 13423 and 13514 both define sustainability as creating and maintaining conditions under which humans and nature can exist in productive harmony, which permits fulfilling the social, economic, and other requirements of present and future generations of Americans. For the Navy, sustainability is its obligation to conserve and protect resources for use in the future and to support a healthy environment in which the Fleet, Fighter, Family, civilian workforce, and their communities can live. It's adhering to becoming systems thinkers where we benefit from the interrelationships of the triple bottom line: mission, community, and environment.

Through the very nature of the installation, its mission and services provided, PNSY exudes sustainable functionality with the consideration of its military and civilian personnel, sensitive environmental surroundings, and total Navy life cycle costs. The social, health, and quality-of-life programs support military as well as the shipyard community. The compact city-like installation is walkable and bicycling is integrated into the work life of many Sailors and employees. The sensitive surrounding ecosystem of the Piscataqua River makes both for aesthetic natural beauty as well as a valuable protected resource.

The process of recycling and refurbishing submarines to extend their operational service is a sustainable concept at the heart of the shipyard. In addition, the first Virginia class submarine arrived at PNSY for servicing in 2011. The Virginia class submarine was at the forefront of today's Navy Green Fleet as the Navy received a White House Closing the Circle Award for its design in 2000. These subs were designed for recyclability at the end of their useful life as well as designed with less hazardous and nontoxic materials. Thus, in terms of use of hazardous substances the Navy has reduced its liability, costs and impacts of manufacturing, operation, and servicing these subs.

SUSTAINABILITY PROGRAM MANAGEMENT

PNSY is committed to continuous process improvement and sustainable business practices. Striving to reduce its environmental impacts and improve operations, there are several departments and teams that manage performance including the Occupational Safety, Health, and Environmental Office (OSHE), Lean Six Sigma Office, as well as the NAVFAC's Public Works Department Maine (PWD-ME).

The objective of the OSHE office at PNSY is to achieve sustained program of safety and environmental excellence protecting and preserving the safety and health of employees and an aggressive approach to environmental management. The OSHE office oversees two critical programs with goals to minimize waste and maximize resource conservation, the Environmental Management System (EMS) and Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP). The EMS at PNSY capitalizes on many existing management practices inherent to the shipyard as well as focuses on the total quality standards and practices established by International Standards Organization (ISO) standard ISO #9000. EMS

takes these well-established principles and tailors them to prevent environmental damage while continuously decreasing the environmental footprint of PNSY. Every person, employee, military personnel, tenant, contractor, or entity is part of the EMS whose target is geared toward pollution prevention and ensuring sustainability criteria of EOs 13423 and 13514 are met. The PNSY-wide program is briefed and reviewed by the OSHE Policy Committee, an inter-tenant management team to effectively implement alternatives where appropriate across base operations.

An example of an effective OSHE pollution prevention management program is CHRIMP which successfully encourages reduced use, reuse, and screening of new hazardous materials that enter the shipyard.

The Lean Office supports PNSY in identifying, evaluating, implementing, and sustaining process improvements that contribute to the shipyard's overall performance through the application of Lean Six Sigma methodologies and tools. The Lean Office promotes sustainability by ensuring the triple bottom line through process improvement. Cost and schedule reductions are achieved by reducing or eliminating unnecessary steps, streamlining process flows, and reducing the environmental impacts of the processes themselves while enhancing personnel safety.

PWD-ME manages facility assets at PNSY. Since 2008, PWD-ME has employed a robust Energy Management Team (EMT) including an Energy Manager, Utilities Energy Manager, Resource Efficiency Manager, and a Sustainability Engineer. The EMT's commitment is to meet Federal, DoD, DoN, and PWD-ME energy and sustainability goals and has implemented several initiatives in effort to meet these goals. Along with the EMT, PWD-ME manages natural and cultural resources as well as an award winning Installation Restoration program to help mitigate impacts associated with development activities preserving its distinct setting.

PROGRAM ACCOMPLISHMENTS

Examples of successful Lean process improvement in FY12&13 include:

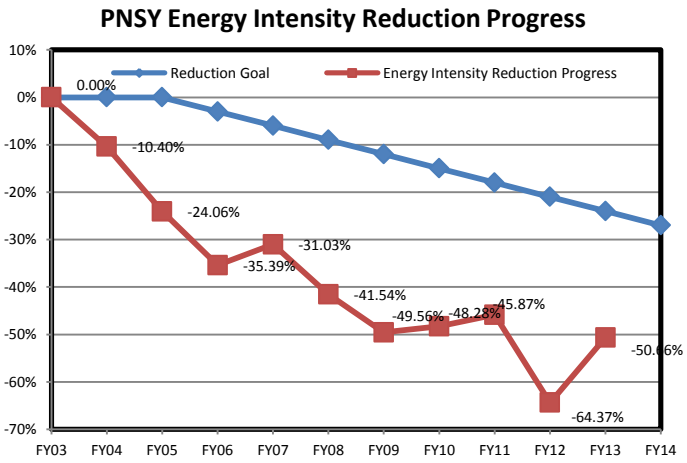
- **Vending Machine Issue of Pre-Packaged Weld Wire**

  Point-of-use (POU) issue of pre-packaged coated weld wire via vending machine eliminated mechanic travel and wait time, provided 24/7 access, and reduced scrap costs associated with required disposal of issued, but unused, weld wire. The PNSY process was accepted as Cumbersome Work Practices (CWP) project #358 for implementation at all shipyards. The project returned an estimated $225,000/year savings by reducing mechanic travel and wait time to obtain weld wire (cost avoidance), and by reducing material waste (scrap costs).

- **Transportation of Cat 1 and 2 Certified Test Weights**

  The need to coordinate PWD-ME transportation services to move test weights around the shipyard was eliminated by establishing dedicated test sites for portal cranes - each site with a full set of dedicated test weights - and by obtaining new stackable weights that can be moved via forklift. Transporting test weights around the shipyard previously caused multiple delays and added cost due to the amount of coordination required and the lack of adequate transportation to efficiently move the existing test weights. Savings of nearly $50,000/year were realized as required number of lifts/year to

move test weights was reduced by two-thirds. Indirect savings were also realized through reducing schedule delays that resulted from inability to transport test weights when required, and through elimination of lost in-service time for cranes. Additionally, reduced fuel consumption was realized from no longer transporting weights.



NAVFAC'S PUBLIC WORKS DEPARTMENT MAINE (PWD-ME) ENERGY AND SUSTAINABILITY TEAM

❖ Energy and Water Reduction

The energy and water consumption have significantly been reduced with the ongoing energy program in place at PWD-ME. Energy intensity has consistently been decreasing at PNSY since baseline year FY03 and far exceeds the EPAct goal for the current year by an additional 25% reduction. Water consumption has continued to decrease as PNSY has exceeded water reduction goals by an additional 20%.

In addition to the programs in place that have increased energy and water efficiencies since 2003, the following projects were successfully initiated in FY12&13 at PNSY:

❖ Energy Conservation Investment Program (ECIP)

PWD-ME installed a solar preheat ventilation system in FY13 on a southern exposed wall of a large industrial building. The project was designed to extend the useful life of the heating equipment within the building and allow better ventilation to keep the building cool during the summer. The project is projected to save 2,200 mmBtus of thermal energy or roughly $22,000 of fuel costs used to generate steam per year.

❖ Energy Restoration & Modernization Program

PWD-ME successfully programmed, designed, and is in construction of over $140M in whole building high performance sustainable renovations and existing building energy system upgrade projects. Several projects have integrated renewable energy technologies such as solar PV, solar ventilation and solar domestic hot water which are estimated to generate approximately 570K MBtu. In addition to energy efficiency, project designs include upgraded space for improved operations and employee productivity reducing total life cycle costs to the Navy.

❖ Leadership in Energy & Environmental Design (LEED) and High Performance Sustainable Building (HPSB)

PWD-ME has been charging forward and is on target for meeting the Federal and DoN policy of 15% of PNSY facilities meeting HPSB criteria and LEED certification by 2015. PWD-ME has certified four LEED Gold projects contributing to successful HPSB projects in FY12&13, PNSY is on track for meeting the FY15 goal upon completion of energy renovation projects currently in construction.

The following HPSB design criteria were met in all LEED projects:

- Water reduction designs >30% over baseline calculated building
- Energy reduction designs >30% over ASHRAE 90.1-2004 by cost
- >20% materials with recycled content
- >15% materials harvested and manufactured locally
- >95% diversion rates for construction waste management
- LID strategies integrated to treat the stormwater on site have included underground soil filters, vegetated detention basins, and a green roof

❖ Solid Waste Reduction

PNSY has consistently been exceeding Federal, DoD, and DoN goals of solid waste diversion of at least 50%. These rates are met with the recycling of industrial waste metals and sand blast grit as well as composting all shredded paper. To further increase the waste diversion rates, PWD-ME enhanced PNSY's office recycling program through the implementation of a single stream recycling in FY12. The result of this program was the doubling of the tonnage of office waste diverted from landfill. The number of buildings that recycled white paper and aluminum cans increased from 18 to approximately 65 that currently recycle most plastic, glass, metal, cardboard, and paper. Average recycling program proceeds for FY12&13 were $314K with an average economic benefit captured from waste diversion for the two years was $445K.

❖ Sustainable Transportation Program

In effort to promote a sustainable community, PNSY has committed to the currently implemented sustainable transportation initiatives to reduce impacts and traffic due to commutes in single occupancy vehicles (SOV). Elements of the PNSY sustainable transportation program include a Transportation Incentive Program (TIP), Vanpool Program with preferred parking, Regional planning for Public Transportation, and a growing green fleet.

In a single day the vanpools are responsible for a reduction of approximately 15,420 Vehicle Miles Traveled which totals about 3.9 million miles per year.

PWD-ME worked with PNSY and a local bus service, COAST bus, to provide express commuter service to the shipyard. The new bus service began in FY12 with two routes located at the main entrance to PNSY and within a year the number of riders and routes more than doubled. At the end of FY13, there were five bus routes with more than 2% of the shipyard population taking advantage of the newly provided public transportation service.

Social Capital and PNSY camaraderie enhanced with Bus Ridership.

"Riding the bus makes me feel like I'm part of society again" - Said a new rider versus driving via SOV for earlybird parking to avoid long traffic delays.

❖ Federal Green Challenge

In commitment to achieve EO 13514 Federal sustainability goals, PNSY became a partner in the cooperative GSA and EPA initiative, the Federal Green Challenge (FGC) for FY12. Partners pledge to decrease its facilities' impact by meeting or exceeding 5% improvement in each of the EO 13514 categories.

❖ PNSY Energy and Sustainability Awards/Recognitions:

- Environmental Protection Agency Federal Green Challenge Leadership Award -2013
- Federal Transit Administrator recognition for newly expanded Clipper Connection focusing on commuting services to PNSY -2012
- CNO Environmental Award, Environmental Restoration, Installation 2012
- SECNAV Energy and Water Management Platinum Level Award - 2012 (received FY13)
- SECNAV Energy and Water Management Gold Level Award -2011 (received FY13)
- CNO Environmental Award, Environmental Restoration, Installation 2011